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Modeling Shear Banding in Amorphous Solids, from Atomistic to Continuum[1] DARIUS ALIX-WILLIAMS, MICHAEL FALK, Johns Hopkins University — Molecular dynamics simulations of strain localization are carried out using different materials systems and interatomic potentials including CuZr modeled via the embedded-atom method (EAM), amorphous Si modeled using Stillinger-Weber (SW) and a binary Lennard-Jones (LJ) system. Quench schedules and strain rates are varied. Different systems exhibit marked similarities in plastic behavior. Systematic differences between systems are analyzed in the context of Shear Transformation Zone (STZ) theory in the effort to develop a generalized constitutive framework for plasticity in glasses. Effective temperature inferred from the potential energy is explored as a local coarse-grained measure of the degree of disorder.

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